

WHAT IS CLAIMED IS:

1. A system for repairing a lumen, said system comprising:

a graft having a tubular body, a superior end and an inferior end;

5 a superior attachment system secured to said superior end of said graft and an inferior attachment system secured to said inferior end of said graft, said superior and inferior attachment systems having a first configuration and a second configuration, said first configuration compressed from said second configuration; and

10 a delivery catheter for placing said graft within the lumen, said delivery catheter having a releasing system, said releasing system including a superior tie to retain said superior attachment system in said first configuration and an inferior tie to retain said inferior attachment system in said first configuration.

15 2. The system of claim 1, wherein said releasing system further includes at least one release wire cooperating with said superior and inferior ties to retain said superior and inferior attachment systems in said first configuration and to place said superior and inferior attachment systems in said second configuration.

3. The system of claim 2, wherein said delivery catheter includes an anti-elongation wire.

4. The system of claim 3, wherein said delivery catheter includes an inner catheter, an inferior capsule catheter, an inferior capsule assembly attached to said inferior capsule catheter, and a superior capsule assembly, said inner catheter disposed within said inferior capsule assembly, said superior capsule assembly and said inferior capsule catheter;

said inferior capsule catheter, said superior capsule assembly and said inner catheter assembly each adapted to move relative to each other; and

said superior capsule assembly adapted to contain said superior attachment system and said inferior capsule assembly adapted to contain said inferior attachment system.

5. The system of claim 4, wherein said delivery catheter further includes a capsule jacket assembly, said capsule jacket assembly adapted to overlay and move relative to said inferior capsule catheter, said superior capsule assembly and said inner catheter.

6. The system of claim 4, wherein said inner catheter includes a control wire lumen adapted to slidably receive a control wire, said control wire

having a distal end secured to said superior capsule assembly.

7. The system of claim 4, wherein said superior capsule assembly includes a flexible and tapered nose cone.

8. The system of claim 4, wherein said inner catheter includes an anti-elongation lumen adapted to receive said anti-elongation wire and at least one notch in communication with said anti-elongation lumen, said anti-elongation wire adapted to exit said anti-elongation lumen through said notch and to be affixed to an exterior of said inner catheter.

9. The system of claim 4, wherein said inner catheter includes a release wire lumen adapted to receive said release wire and at least one notch in communication with said release wire lumen, said release wire exiting said release wire lumen through said at least one notch to engage said tie and to reenter said release wire lumen through said notch.

10. The system of claim 9, wherein said inner catheter includes a conical-shaped knob cooperating with said superior capsule assembly for retracting said superior capsule assembly through said graft.

11. The system of claim 4, wherein said inner catheter includes a release wire lumen, said release wire slidably disposed in said release wire lumen, an inferior notch and a superior notch each in communication with said release wire lumen, said release wire exiting said inferior notch, engaging said inferior tie and reentering said inferior notch, said release wire further exiting said superior notch, engaging said superior tie and reentering said superior notch.

12. The system of claim 11, wherein said superior and inferior ties each include a single suture, each said suture secured at a midpoint to said graft, formed into two loops through which said release wire is threaded and affixed at their ends to said graft.

13. The system of claim 12, wherein each said suture is secured to said graft so that each said suture resides exterior said graft.

14. The system of claim 13, wherein said release wire passes through a wall of said graft near said inferior end of said graft to engage said inferior tie and passes through said wall of said graft near said superior end of said graft to engage said superior tie.

15. The system of claim 13, wherein each said suture is passed through a wall of said graft to engage said release wire.

16. A graft for intraluminal repair of a thoracic aortic aneurysm, comprising:

5 a hollow tubular body, a superior end and an inferior end, said hollow tubular body having a pre-determined diameter, length and wall thickness adapted for intraluminal repair of a thoracic aortic aneurysm.

17. The graft of claim 16, wherein said pre-determined diameter ranges from 30-40 mm.

18. The graft of claim 16, wherein said pre-determined length ranges from 7-15 cm.

19. The graft of claim 16, wherein said pre-determined wall thickness ranges from .127 to .229 mm.

20. A method for placing a graft within a lumen, which comprises the steps of:

5 providing a graft having an attachment system secured thereto, said attachment system having a first configuration and a second configuration, said first configuration compressed from said second configuration;

providing a delivery catheter for receiving
said graft and for placing said graft within the lumen,
said delivery catheter having a releasing system
cooperating with said attachment system, said releasing
5 system including a tie and a release wire;

placing said release wire into engagement
with said tie;

causing said tie to place said attachment
system in said first configuration;

10 loading said graft within said delivery
catheter;

placing said delivery catheter within the
lumen;

unloading said graft from said delivery
15 catheter; and

removing said release wire from engagement
with said tie to permit said attachment system to
assume said second configuration and to engage the
lumen.

21. A method for repairing a thoracic aortic
aneurysm, which comprises the steps of:

providing a graft having an attachment system
secured thereto, said attachment system having a first
5 configuration and a second configuration, said first
configuration compressed from said second
configuration;

providing a delivery catheter for receiving said graft and for placing said graft within the thoracic aorta, said delivery catheter having a releasing system;

5 causing said releasing system to retain said attachment system in said first configuration;

loading said graft within said delivery catheter;

10 placing said delivery catheter within a patient's vasculature;

advancing said delivery catheter to the thoracic aorta;

unloading said graft from said delivery catheters; and

15 causing said releasing system to permit said attachment system to assume said second configuration and to engage said thoracic aorta.